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(54) **Assembly and lighting device for components of shop furnishings**

(57) An assembling and lighting device for components of shop furnishings, comprising a cylindrical body (13) provided with a spring locking device (17) and able to be fastened to an upright (10a, 10b) of a support structure, and an end member (15), which can be fastened to an arm (11a, 11b) of the support structure and is intended

to be snap-engaged with the spring locking device (17). The end member (15) also has, associated with it, a conductor means (28) able to establish an electrical connection between an electrical power supply unit (40) and a lighting unit (50) for the furnishing components, when the end member (15) engages with the spring locking device (17).

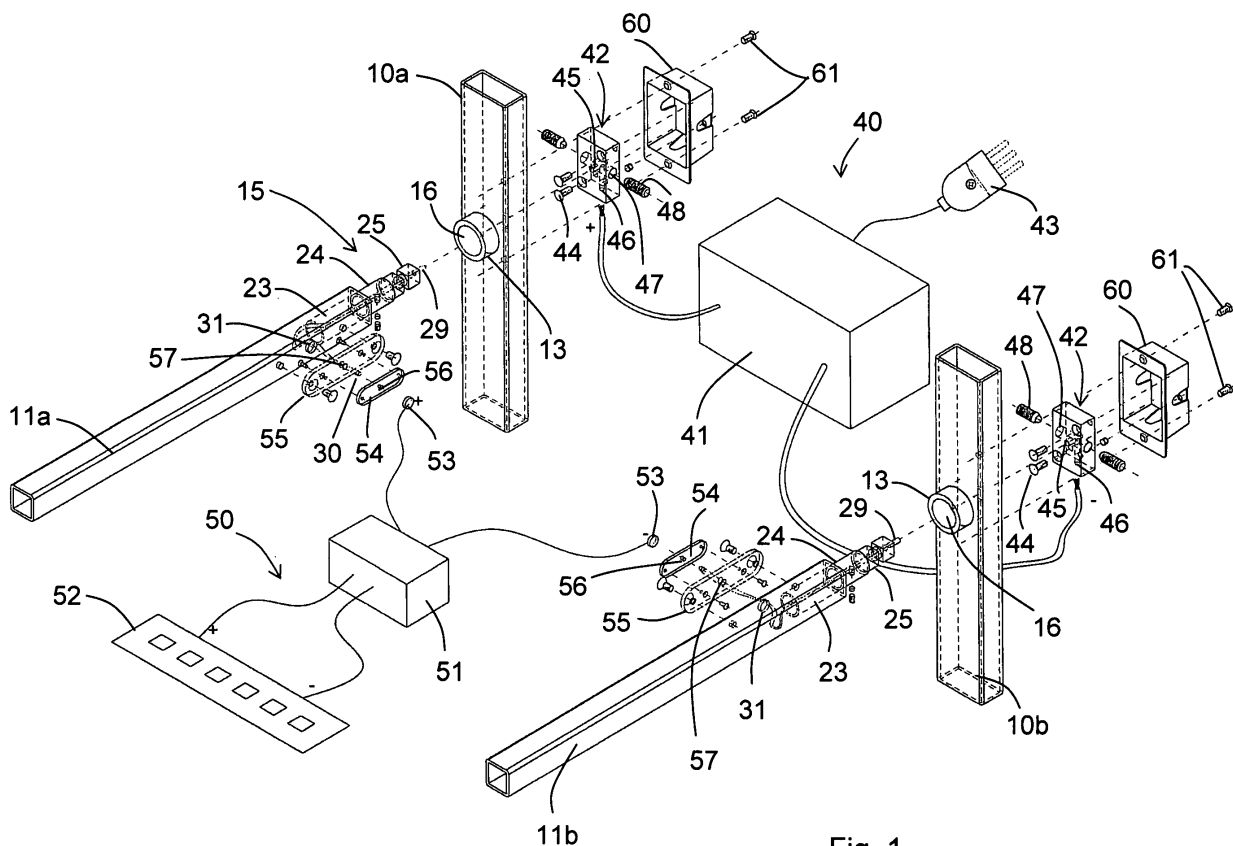


Fig. 1

Description

[0001] The present invention relates, in general, to a device for assembling and lighting components of shop furnishing, in particular a device for mounting, on a support structure, accessories such as hanging devices, shelves and/or panels and for electrically connecting them to associated lighting means.

[0002] A pressing requirement, in particular in the retail sales sector, is that of lighting in a specific manner the products on display in the display window or arranged on a shelf in a shop; it is considered, in fact, that by so doing, these products are more attractive in the eyes of potential buyers.

[0003] In the market there exist shelf lighting devices comprising, for example, spotlights mounted on panels or other supports suspended above the articles to be illuminated.

[0004] There exist, moreover, shelves and/or panels with lighting means incorporated. In this case, it would be necessary to replace the existing shelves and/or panels with these shelves and/or panels equipped with a specially designed lighting system, with a consequent increase in the costs of the overall display system.

[0005] Moreover, the electric circuit intended to power the lighting means provided on or in the vicinity of a shelf is an independent circuit, namely completely separate from the means for mounting the shelf on a respective support structure and this complicates the mounting and subsequent wiring operations with a consequent increase in installation times and costs.

[0006] It is therefore desirable to have a device for mechanically mounting components of shop furnishings which is of the so-called "electrified" type, i.e. which also incorporates the parts essential for specific illumination of the merchandise displayed.

[0007] These and other objects are achieved by a device for assembling and lighting components of shop furnishings, having the characteristic features defined in Claim 1. Further advantageous characteristic features of the device are specified in the dependent claims.

[0008] Characteristic features and advantages of the present invention will appear more clearly from the following detailed description of its currently preferred embodiments, provided solely by way of a non-limiting example, with reference to the accompanying drawings in which:

- Figure 1 is an exploded perspective view of a device for assembling and lighting components of shop furnishings according to the present invention, mounted on a support structure for supporting a shelf;
- Figure 2 is an exploded and enlarged perspective view of the device according to Figure 1;
- Figure 3 is an enlarged cross-sectional view of a detail of the device according to Figure 1;
- Figure 4 is a partial side view of the support structure according to Figure 1;

- Figure 5 is a cross-sectional view along the line V-V of Figure 4;
- Figure 6 is a cross-sectional view along the line VI-VI of Figure 5; and
- Figure 7 shows another embodiment, in which the device according to the invention is associated with a support structure for supporting two shelves.

[0009] In the attached drawings, parts or components which are the same or similar have been indicated by the same reference numbers.

[0010] With reference to Figures 1 to 6, these illustrate a support structure for components of shop furnishings in which a pair of devices for assembling and lighting a shelf according to the invention have been mounted.

[0011] The support structure is formed by a pair of metal uprights 10a, 10b and a pair of arms 11a, 11b also made of metal and each projecting from the respective upright and intended to support a shelf (not shown). An assembling and lighting device is associated with each upright/arm unit of the support structure.

[0012] More particularly, as better shown in Figure 2, this device, which is generally indicated by the reference number 12, is formed by a cylindrical body 13 and by an end member 15 intended to be engaged, during use, inside the cylindrical body 13. The cylindrical body 13 is fixed at a desired height, for example by means of welding, screws and the like, to a respective upright, for example 10a, while the end member 15 is fixed to a respective arm, for example 11a. As shown in Figure 3, the cylindrical body 13 has an axial through-hole which is formed, in succession, by a cylindrical cavity 16 and by a square hole 14 coaxial with the cavity 16 and with which a spring locking device 17 formed by a threaded grub screw 18, a spring 19 and a ball 20 co-operates.

[0013] The end member 15 is formed a tubular body 21 having a first portion 23 intended to be inserted inside the arm 11a and fixed thereto, for example by means of welding, and a second portion 24 able to be inserted inside cylindrical cavity 16 of the cylindrical body 13, and the external end of the tubular body 21 is fixed to a stem 25 with a square cross-section provided with a longitudinal through-hole 26 and intended to be inserted inside the square hole 14 of the cylindrical body 13. A recess 27 is formed in the outer surface of the stem 25 and is able to co-operate with the ball 20 of the spring locking device 17, thus forming a snap-engaging joint between the cylindrical body 13 and the end member 15.

[0014] The end member 15 is passed through along its entire length by a conductor means 28, for example a brass pin, which passes inside the hole 26 of the stem 25 and the tubular body 21. A first end 29 of the conductor means 28 projects outside the stem 25 and its second end 30 passes out from the arm 11a through an opening 31 formed therein.

[0015] In order to mount a shelf on the support structure, a hole is formed in each of the two uprights 10a and 10b and the cylindrical body 13 of the device 12 is fixed

inside it. Then, fixing of the tubular body 21 of the end member 15 to a respective arm 11a, 11b is performed, this being performed in such a way that the second end 30 of the conductor means 28 passes out through the opening 31.

[0016] At this point the two stem parts 15 with the arms 11a, 11b associated with them are inserted inside the respective cylindrical bodies 13 until snap-engagement occurs between the ball 20 of the spring locking device 17 associated with the cylindrical body 13 and the recess 27 formed in the stem 25 of the end member 15. In this mounting position, the first end 29 of each conductor means 28 projects outside the respective upright 10a, 10b.

[0017] The assembling stage is followed by the electrical connection of a light source provided in the region of the shelf. For this purpose, an electric power supply unit 40 and an lighting unit 50 are envisaged. More particularly, the power supply unit 40 is formed by a transformer 41 and by electrical contact means 42, typically two brass terminals, one for each device 12. The transformer 41 converts the high-voltage current, drawn from the electrical mains via an ordinary electric plug 43, into low-voltage current (24V) intended to power the lighting unit associated with a shelf. The pair of terminals 42 has the function of establishing and maintaining an electrical connection between the first end 29 of the conductor means 28 of each device 12 and the transformer 41.

[0018] Each terminal 42 is fixed, by means of screws 44, inside a respective box-shaped body 60 made of plastic, for example polypropylene, in turn fixed to the respective upright 10a, 10b by means of screws 61 and having the function of insulating the terminal 42 from the said upright. The terminal 42 has a blind hole 45 formed in one of its front surfaces directed, during use, towards the respective upright 10a, 10b, said hole 42 being intended to receive the end 29 of the conductor means 28. The terminal 42 also has, formed therein, a hole 46 which emerges inside the blind hole 45 and is used for insertion of a conductor wire 62, 63 (Figure 5) for connection to the transformer 41. In order to ensure fixing of the end 29 of the conductor means 28 inside the blind hole 45 and a secure electrical contact with the end of the conductor wire 62, 63, a through-hole 47 is envisaged, inside which hole two spring-loaded threaded pressure pieces 48 are screwed.

[0019] The lighting unit 50 comprises power supply means 51, at least one light source - in the example an LED array 52 - and a pair of electrical contacts.

[0020] Each electrical contact is formed by a magnet means 53 associated with a metal plate 54 which is preferably made of nickel-plated iron and which, during use, is fixed, with the arrangement in between of an insulating means, such as a plate 55 made of plastic, to a respective arm 11a, 11b of the support structure. The metal plate 54 and the insulating plate 55 have an opening, 56 and 57 respectively, each opening, during use, being coaxial with the opening 31 in the arm 11a, 11b in order to allow

passing out of the second end 30 of the conductor means 28 and its subsequent electrical connection to the magnet means 53.

[0021] With reference to Figure 5, the circuit for lighting a shelf by means of the device according to the present invention will now be described.

[0022] The phase conductor wire 62 of the transformer 41 is inserted inside the hole 46 of the terminal 42 fixed to one of the two uprights, for example to the upright 10a, of the support structure, until it makes electrical contact with the first end 29 of the conductor means 28 of a device 12 associated with the arm 11a, and is fastened in this position by means of the two spring-loaded pressure pieces 48. The second end 30 of the conductor means 28 is electrically connected to the magnet means 53 associated with the phase conductor wire 58 of the power supply means 51 of the LED array 52.

[0023] Correspondingly, the neutral conductor wire 63 of the transformer 41 is inserted inside the hole 46 of the terminal 42 fixed to the other upright, for example to the upright 10b, of the support structure until it makes electrical contact with the first end 29 of the conductor means 28 of the device 12 associated with the other arm 11b, and is fastened in this position by means of the two spring-loaded pressure pieces 48. The second end 30 of the conductor means 28 is connected electrically to the magnet means 53 associated with the neutral conductor wire 59 of the power supply means 51.

[0024] The mains current is converted into low voltage current by the transformer 41 and, via the phase conductor wire 62 of the transformer, the conductor means 28, the magnet 53 and the phase conductor wire 58 of the power supply means 51, reaches the LED array 52, energizing it with consequent illumination of the shelf. Once it has passed through the LED array 52, the current returns to the transformer 41, flowing through the neutral conductor wire 59 of the power supply means 51, the magnet 53, the conductor means 28 and the neutral conductor wire 63 of the transformer 41, which close the circuit.

[0025] In the embodiment shown in Figure 7, a support structure for assembling and lighting two shelves is shown. In this case, two pairs of arms 11a, 11b are associated with each upright 10a, 10b, each pair having a respective assembling and lighting device and being able to support a respective shelf provided with one or more light sources 52. Both the light sources 52 are powered by an electric current which is supplied by a transformer 41 and which flows inside two electric circuits formed in the manner described above.

[0026] From that described hitherto it can be easily understood how the device for assembling and lighting components of shop furnishings according to the present invention, by providing both the mounting function and electric power supply function in a single component, is able to simplify the installation operations as well as limit their costs.

[0027] The device described above may be subject to

modifications and variations within the scope of protection defined by the claims. For example, although an example of embodiment comprising a pair of mounting and lighting devices has been described, one intended to create an electrical connection between the phase conductor wire of the transformer and the phase conductor wire of the power supply unit for the LED array, and the other able to connect electrically the neutral conductor wire of the power supply unit and the neutral conductor wire of the transformer, it is possible to envisage a support structure provided with only one device according to the invention, intended to create an electrical connection between the phase conductor wire of the transformer and the phase conductor wire of the power supply unit and directly connect the neutral conductor wires of the power supply unit and transformer in order to close the electric circuit.

[0028] Also, it could be envisaged using two devices according to the invention, both able to conduct the phase (outgoing circuit) and connect directly the neutral conductor wires of the power supply unit and transformer in order to close the electric circuit. In this way two electric circuits are obtained, with the possibility of switching from one to the other one, for example in the case where, following a fault, in one of the devices the current flow from the transformer to the power supply unit of the LED array is interrupted.

Claims

1. A device for assembling and lighting components of shop furnishings, comprising a cylindrical body (13), provided with a spring locking device (17) and able to be fastened to an upright (10a, 10b) of a support structure, and an end member (15), which can be fastened to an arm (11a, 11b) of said support structure and is intended to be snap-engaged with said spring locking device (17) of said cylindrical body (13),
characterized in that said end member (15) has, associated with it, a conductor means (28) able to establish an electrical connection between an electric power supply unit (40) and an lighting unit (50) four said furnishing components, when said end member (15) engages with said spring locking device (17).
2. Device according to Claim 1, **characterized in that** said cylindrical body (13) comprises an axial through-hole formed, in succession, by a cylindrical cavity (16) and by a square hole (14).
3. Device according to Claim 1 or 2, **characterized in that** said end member (15) comprises a tubular body (21) having a first portion (23) for fixing to said arm (11a, 11b), a second portion (24) able to be engaged with said cylindrical cavity (16) and a stem (25) with a square cross-section able to be snap-engaged inside said square hole (14).
4. Device according to any one of the preceding claims, **characterized in that** said conductor means (23) is housed inside a longitudinal through-hole (26) of said stem (25) with a square cross-section and inside said tubular body (21).
5. Device according to any one of the preceding claims, **characterized in that** said conductor means (28) comprises a first end (29) projecting from said stem (25) with a square cross-section and a second end (30) projecting from said first cylindrical portion (23).
6. Device according to any one of the preceding claims, **characterized in that** said electric power supply unit (40) comprises a transformer (41) and electrical contact means (42).
7. Device according to Claim 6, **characterized in that** said electrical contact means consist of a terminal (42) which has a blind hole (45), a hole (46) communicating with said blind hole (45) and a threaded through-hole (47) which intersects said blind hole (45) and said hole (46).
8. Device according to Claim 7, **characterized in that** said terminal (42) comprises a pair of spring-loaded pressure pieces (48) for fastening together said first end (29) of said conductor means (28) and the end of a conductor wire (62, 63) of said transformer (41).
9. Device according to Claim 7 or 8, **characterized in that** said terminal (42) is fixed inside a box-shaped body (60) made of plastic.
10. Device according to any one of the preceding claims, **characterized in that** said lighting unit (50) comprises power supply means (51), at least one light source (52) and a pair of electrical contacts (53, 54, 55).
11. Device according to Claim 10, **characterized in that** said at least one light source is an LED array (52).
12. Device according to Claim 10, **characterized in that** each electrical contact of said pair of electrical contacts comprises a magnet means (53), a metal plate (54) and an insulating means (55).
13. Support structure for components of shop furnishings, **characterized in that** it comprises at least one upright (10a, 10b), at least one arm (11a, 11b) projecting from a respective upright and able to support a furnishing component, and at least one device (12) according to any one of Claims 1 to 12.

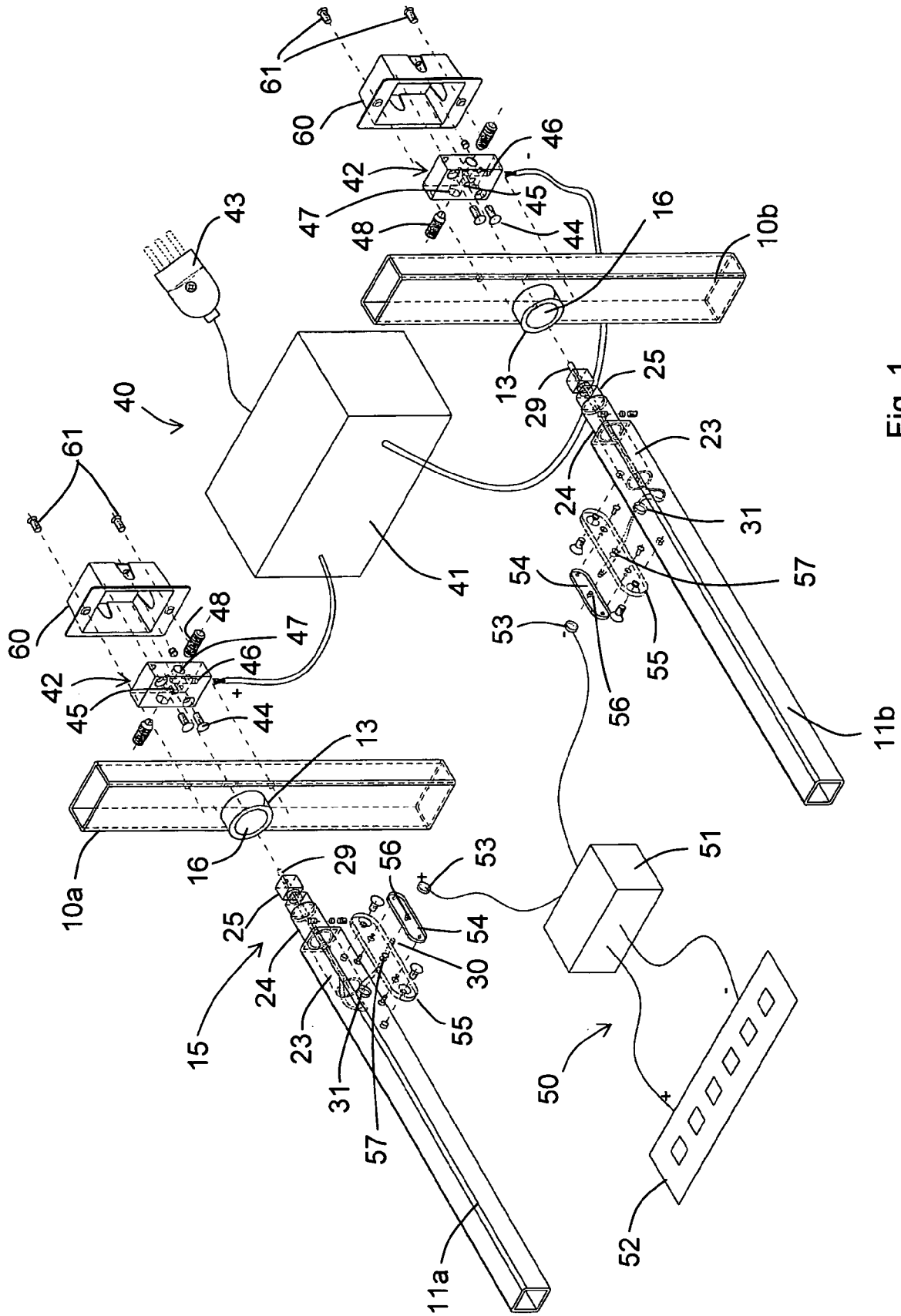
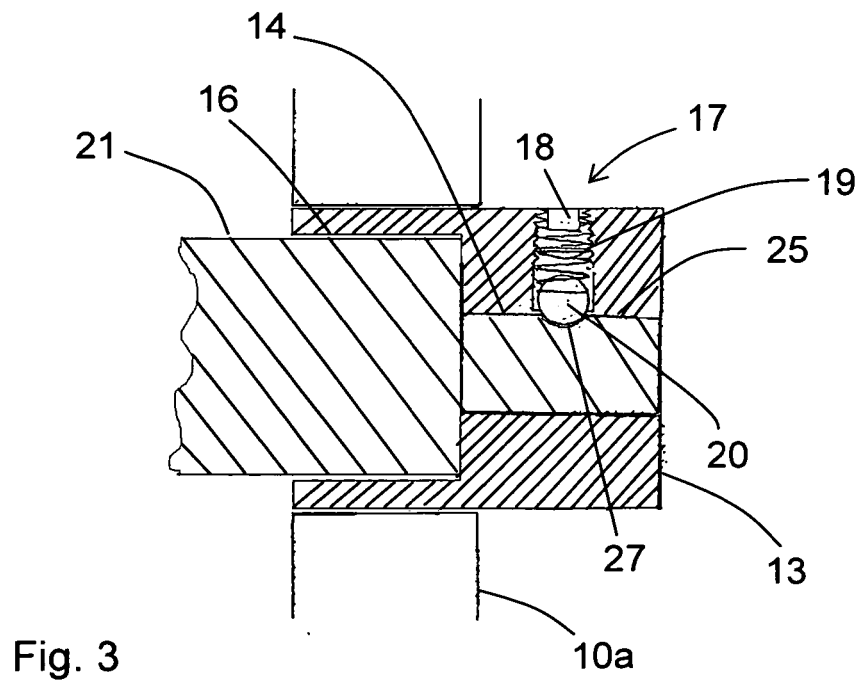
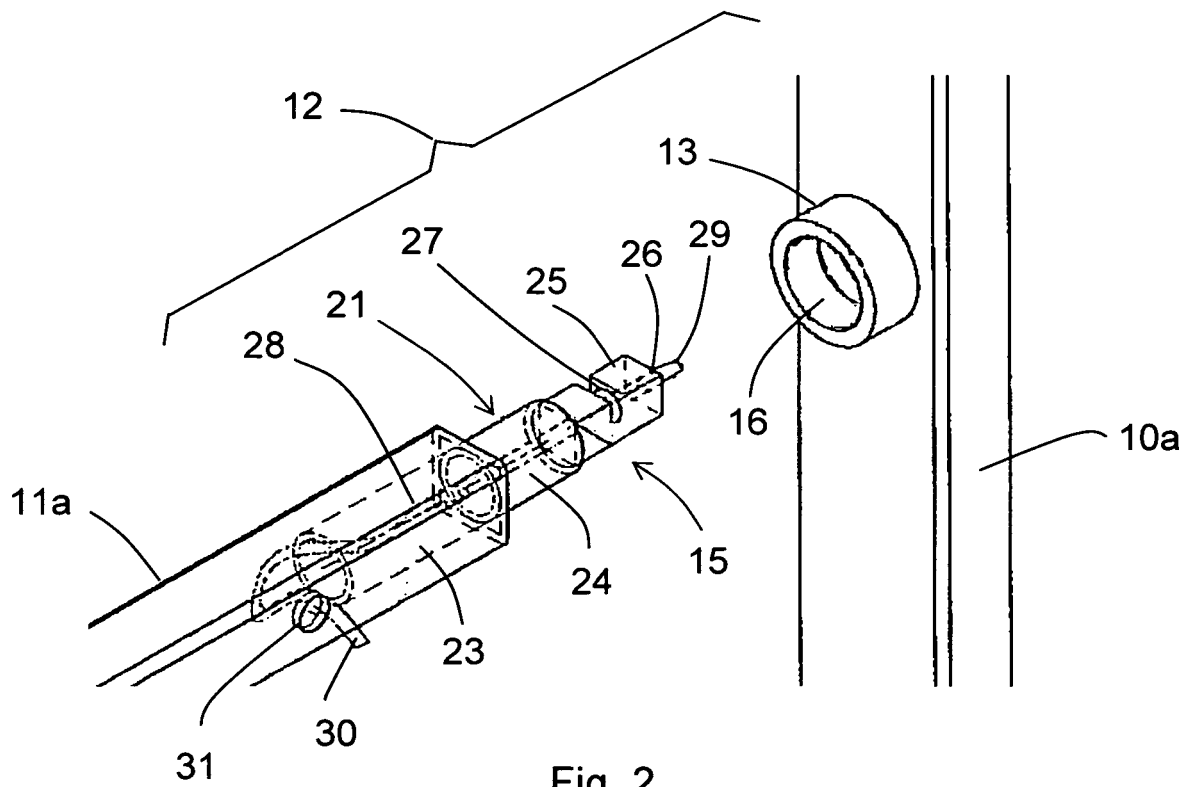
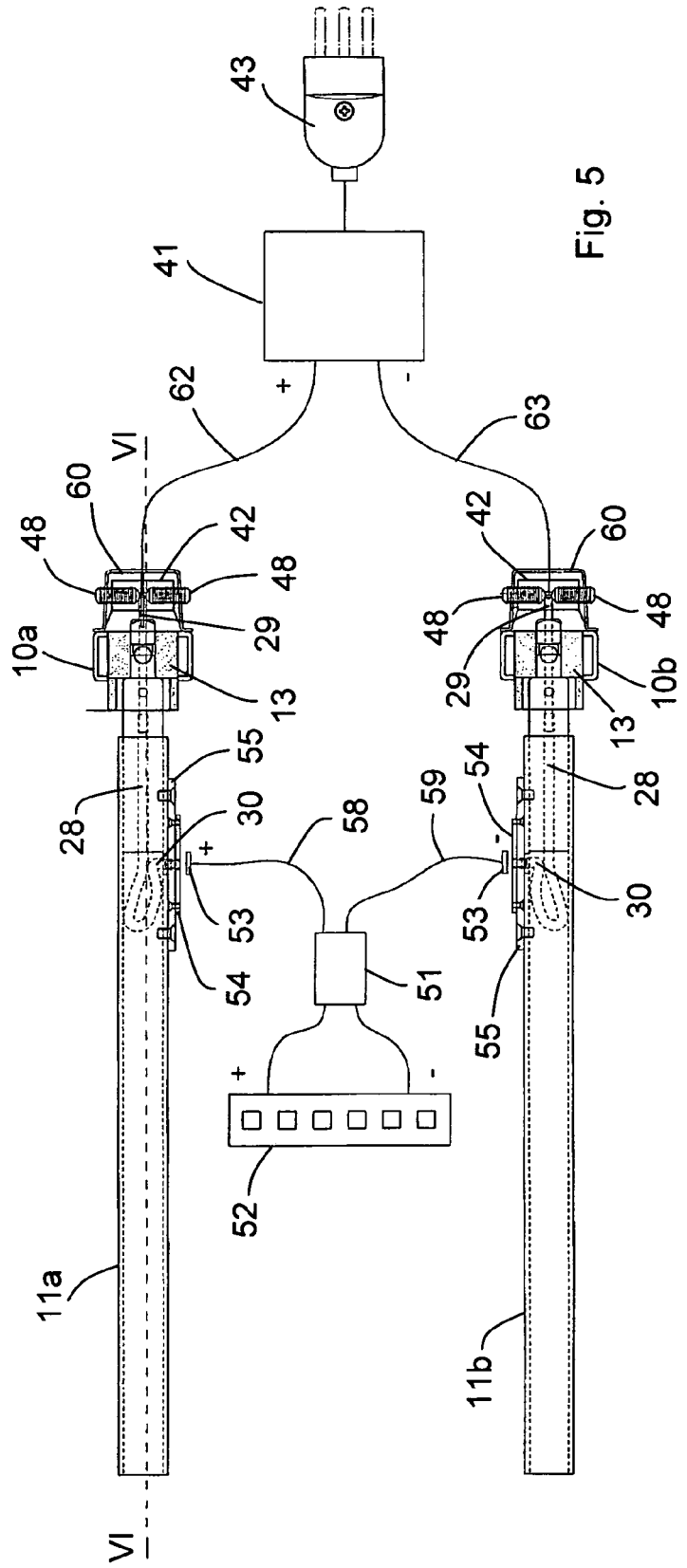
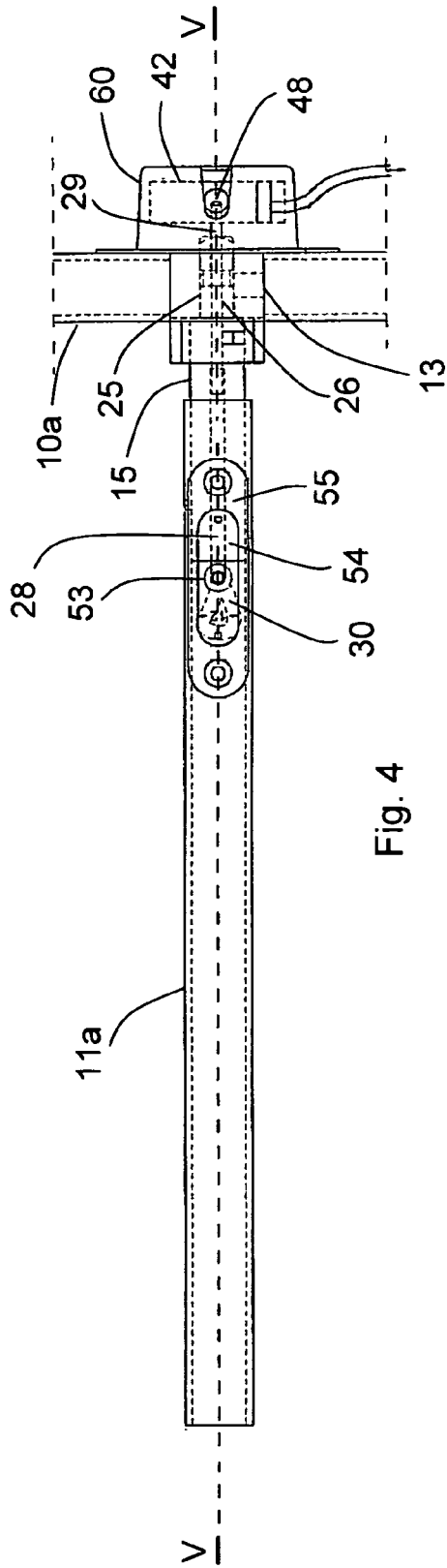


Fig. 1





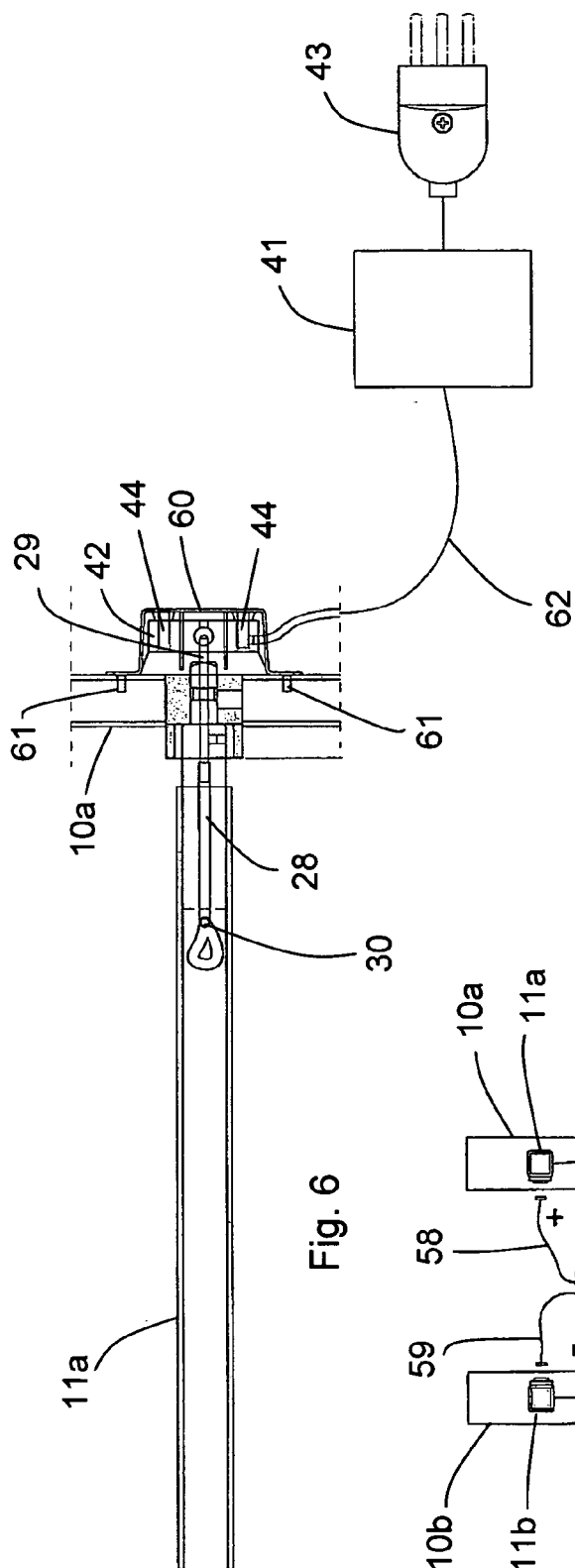


Fig. 6

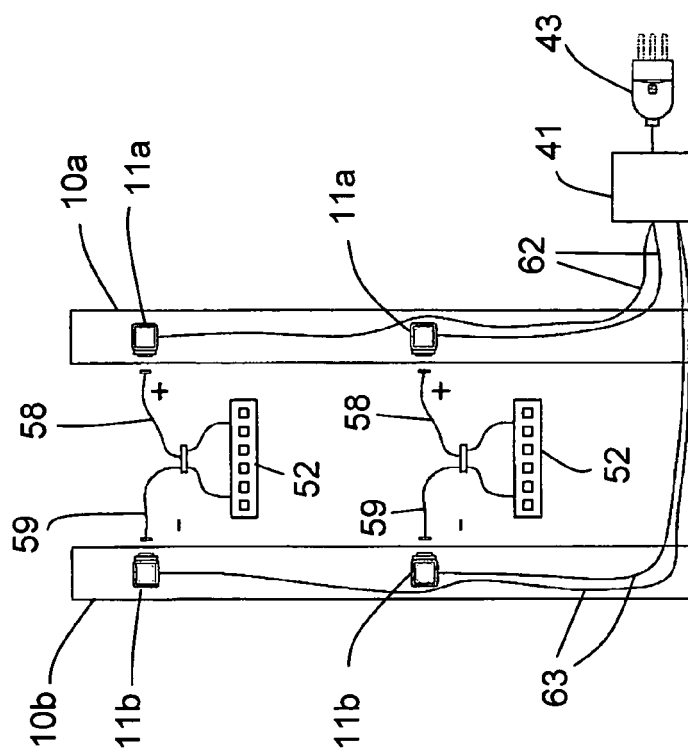


Fig. 7



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Application Number
EP 07 42 5523

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Place of search The Hague		Date of completion of the search 9 January 2008	Examiner Allen, Katie
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